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Notice of Allowability

Application No.

10/027,372

Examiner

Un C Cho

Applicant(s)

HAJIMIRI ET AL.

Art Unit

2687

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9 February 2005.
2. ☒ The allowed claim(s) is/are 6-14.
3. ☒ The drawings filed on 29 November 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>2/2/05</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Allowable Subject Matter

1. Claims 6 – 14 are allowed.
2. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, Yeh in view of Liu and further in view of Abdelgany discloses a first down conversion stage (Yeh, Page 7, lines 44 – 52 and Liu, Page 1, Paragraph 0011 lines 1 – 6 and Paragraph 0012, lines 1 – 8). However, Yeh, Liu and Abdelgany either alone or in combination fails to teach a second mixer connected to the LO₁ block and the front-end subsystem and adapted to mix the quadrature LO₁ signal with the front-end signal and to supply a resultant quadrature IF signal, wherein the first predetermined frequency of the LO₁ block is offset from the midpoint of the two desired bands such that the image frequency bands of the two desired bands fall at attenuation regions of the front-end transfer function.

Regarding claim 8, Yeh in view of Liu and further in view of Abdelgany discloses a subsequent down conversion stage (Abdelgany, Page 14, Paragraph 0134 lines 1 – 8). However, Yeh, Liu and Abdelgany either alone or in combination fails to teach a second quadrature local oscillator block adapted to produce an in-phase signal and a quadrature signal at a second given frequency, a first IF frequency mixing stage connected to the LO₂ block and the first mixer that is adapted to mix the in-phase IF signal with the in-phase signal of the LO₂

block and to supply a resultant first low frequency signal, a second IF mixing stage connected to the LO₂ block and the second mixer that is adapted to mix the quadrature signal of the LO₂ block with the quadrature IF signal and to supply a resultant second LF signal, a third quadrature local oscillator block adapted to produce an in-phase signal and a quadrature signal at a third given frequency, a third IF mixing stage connected to the LO₃ block and the first mixer that is adapted to mix the in-phase LO₃ signal with the in-phase IF signal and to supply a resultant third LF signal and a fourth IF mixing stage connected to the LO₃ block and the second mixer that is adapted to mix the quadrature LO₃ signal with the quadrature IF signal and to supply a resultant fourth LF signal.

Regarding claim 13, Yeh in view of Liu and further in view of Abdelgany discloses the first down conversion stage including a front-end signal phase shifter connected to the front-end subsystem that provides a quadrature front-end signal along a quadrature front-end signal path, a first local oscillator block adapted to supply an in-phase signal of a first predetermined frequency, a first mixer connected to the LO₁ block and the front-end subsystem that is adapted to mix the LO₁ signal with the front-end signal and to supply a resultant in-phase intermediate frequency signal (Yeh, Page 7, lines 44 – 52, Liu, Page 1, Paragraph 0011 lines 1 – 6 and Paragraph 0012, lines 1 – 8 and Abdelgany, Page 14, Paragraph 0134 lines 1 – 8). However, Yeh, Liu and Abdelgany either alone or in combination fails to teach a second mixer connected to the LO₁ block and the front-end phase-shifter and adapted to mix the LO₁ signal with the

quadrature front-end signal and to supply a resultant quadrature IF signal, wherein the first predetermined frequency of the LO_1 block is offset from the midpoint of the two desired bands such that the image frequency bands of the two desired bands fall at attenuation regions of the front-end transfer function.

Regarding claim 14, Yeh in view of Liu and further in view of Abdelgany discloses the down converting step including splitting the RF signal to first and second signal processing paths, mixing the RF signal on the first path with an in-phase first local oscillator signal to produce an in-phase intermediate frequency signal (Yeh, Page 7, lines 44 – 52, Liu, Page 1, Paragraph 0011 lines 1 – 6 and Paragraph 0012, lines 1 – 8). However, Yeh, Liu and Abdelgany either alone or in combination fails to teach filtering the quadrature IF signal, mixing the filtered in-phase IF signal with an in-phase second local oscillator signal, mixing the filtered quadrature IF signal with the quadrature LO_2 signal, mixing the filtered in-phase IF signal with an in-phase LO_3 signal, mixing the filtered quadrature IF signal with the quadrature LO_3 signal, adding the mixed in-phase LO_2 signal to the quadrature LO_2 signal and subtracting the mixed in-phase LO_3 signal from the mixed quadrature LO_3 signal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Un C Cho whose telephone number is (703) 305-8725. The examiner can normally be reached on M ~ F 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (703) 306-3016. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SONNY TRINH
PRIMARY EXAMINER

Un C Cho
Examiner
Art Unit 2687

2/16/2005 UC